TO: Abdi Haile, Supervising Engineering Geologist
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FROM: Cathy Sanford
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DATE: March 22, 2016

SUBJECT: Staff Report: Coachella Valley Salt and Nutrient Management Plan (SNMP) Workshop

BACKGROUND

During the February 20, 2016 Public Workshop about establishing water quality priorities for our Region, the Colorado River Basin Regional Water Quality Control Board (Regional Water Board) designated the Coachella Valley (CV) SNMP as one of its priorities.

Montgomery Watson Harza (MWH) developed the proposed SNMP on behalf of the Coachella Valley Water District (CVWD), the Desert Water Authority (DWA), and the Indio Water Authority (IWA). Regional Water Board staff, and other key stakeholders, raised technical and policy concerns regarding the proposed SNMP, concerns that Regional Water Board staff believes have not been adequately addressed by the proponents of the SNMP. The Interim Executive Officer (EO) requested the Regional Water Board to schedule a workshop to evaluate the concerns and provide direction to the staff on how to resolve these concerns. The Board asked the Interim EO to schedule the Workshop on March 28, 2016. This memorandum provides the Regional Water Board staff report for the Workshop and provides background on the matter, discusses the outstanding issues and range of alternatives available to the Regional Water Board regarding the SNMP, and the staff's recommendation on the matter.

REGULATORY CONTEXT

On February 3, 2009, the State Water Resources Control Board (State Water Board) adopted the Recycled Water Policy (Policy). The Policy was amended on January 22, 2013, to include monitoring requirements for Constituents of Emerging Concern (CECs) and surrogates in recycled waters used for groundwater recharge, and to reduce priority pollutant monitoring of recycled water used for landscape irrigation. The amended Policy became effective on April 24, 2013, the date of Office of Administrative Law approval.

One purpose of the Policy is to increase the use of recycled water from municipal wastewater sources. The Policy also requires that salts and nutrients from all sources be managed on a basin-wide or watershed-wide basis in a manner that ensures attainment of water quality objectives (WQOs) and protection of beneficial uses. Therefore, the Policy requires that salts and nutrients

be managed through the development of regional or sub-regional SNMPs rather than through imposing requirements solely on individual recycled water projects.

Key Elements of Salt and Nutrient Management Plans —The Policy describes in detail the required elements of SNMPs. The SNMPs must consider site-specific conditions, including size and complexity of the groundwater basin, source water, stormwater recharge, hydrogeology, and aquifer water quality. Additionally, each SNMP must include:

- determination of ambient water quality (AWQ);
- salt and nutrient source identification;
- basin/sub-basin assimilative capacity and loading estimates;
- fate and transport of salts and nutrients;
- anti-degradation analysis demonstrating that the projects included within the plan collectively satisfy the requirements of Resolution 68-16;
- water recycling and stormwater recharge/use goals;
- a basin/sub-basin wide monitoring plan;
- a provision for annual monitoring of CECs; and
- implementation measures to manage salt and nutrient loading in the basin/sub-basin on a sustainable basis.

The following section discusses in more detail the elements that are the main foundation of SNMPs.

Ambient Water Quality—Even though the Policy does not explicitly define AWQ, AWQ has been interpreted to be the average quality of water that currently exists for a particular water body. The Policy requires that for those basin/sub-basins where the Regional Water Board has not established Assimilative Capacity and that involve groundwater recharge projects with recycled water, that it be determined by calculating the average groundwater mineral concentration of the basin/sub-basin, either over the most recent 5 years of data available or using a data set approved by the Regional Water Board EO.

Salt and Nutrient Source Identification—The SNMP must identify all sources of salts and nutrients entering the basin/sub-basin. The source of salt and nutrients in groundwater can be natural soils/conditions, discharges of waste, irrigation using surface water, groundwater or recycled water and water supply augmentation using surface water (such as water from the Colorado River) or recycled water. Regulating recycled water alone does not address all these sources.

Assimilative Capacity and Sources of Salts and Nutrients—The Policy requires that SNMPs assess fate and transport of salts and nutrients and determine the assimilative capacity of the groundwater basin to receive and accommodate natural and anthropogenic sources of these contaminants. Salts and nutrients are introduced to the subsurface by percolation through soils. Contaminants that are highly soluble, such as salts, move readily from surface soils to saturated materials below the water table. Fate and transport models can be used to simulate contamination movement through the subsurface and where it will likely flow based on the unique set of geological, hydrological, biological and meteorological patterns at a particular location. The available assimilative capacity of a basin/sub-basin or management zone (MZ) is the difference between a chemical constituent's WQO, which is established at a level that is protective of beneficial uses of the water resource, and the current AWQ in the basin/sub-basin.

Anti-degradation Analysis—The State Water Board adopted Resolution No. 68-16, which is known as the Anti-degradation Policy. This policy requires that existing high quality water be maintained and that any proposed degradation: (1) must be consistent with maximum benefit to

the people of the State, (2) will not unreasonably affect present and anticipated beneficial use of such water, and (3) will not result in water quality less than that prescribed in policies as of the date on which such policies became effective. The Anti-degradation Policy also requires that best practicable treatment or control (BPTC) technologies be used in assessing proposed degradation of existing water quality. Each SNMP is required to include an anti-degradation analysis demonstrating that the projects included in the SNMP will, collectively, satisfy the requirements of Resolution 68-16.

HYDROLOGICAL CONTEXT

Overview of the Coachella Valley (CV) Groundwater Basin

The CV Groundwater Basin, which is the subject of the CV SNMP, is the highest priority groundwater basin within the jurisdiction of the Regional Water Board. The CV Groundwater Basin is complex with areas delineated by fault boundaries and characterized by differences in geology, hydrologic conditions, and lateral and vertical variability in water quality. The aquifer system consists of valley fill from erosion of the adjacent mountains. Recharge to the aquifers is primarily from imported Colorado River water and irrigation, landscape irrigation return, with lesser recharge from runoff from surrounding mountains, stream flow from the Whitewater River and other rivers and creeks and precipitation. The primary aquifer in the CV is the Whitewater River aquifer, characterized by highly permeable soils with a single aquifer in the west and along the mountain fronts, and multiple aquifers with finer grained, less permeable soils in the east portion of the CV. Beneficial uses of the groundwater in the CV include municipal, agricultural, and industrial supply.

Summary of Proposed CV SNMP

The proposed SNMP has been under development since May 2014 and was finalized by the proponents of the SNMP in June 2015. It divides the aquifer into four sub-basins: Whitewater River, Mission Creek, Garnet Hill, and Desert Hot Springs. The Indio and Desert Hot Springs sub-basins are further divided creating seven MZs as follows [pg. 4-24]:

Whitewater River (Indio) Sub-basin
- MZ1: West Whitewater River
- MZ2: East Whitewater River

Mission Creek Sub-basin
- MZ3: Mission Creek

Garnet Hill Sub-basin
- MZ4: Garnet Hill

Desert Hot Springs Sub-basin
- MZ5: Miracle Hill
- MZ6: Sky Valley
- MZ7: Fargo Canyon

Attachment A shows the MZs. A summary of key components of the CV SNMP are outlined in the following sections.

Ambient Water Quality—The CV SNMP identified at least 11 areas within the Coachella Valley with distinct geologic and hydrologic characteristics. However, CV SNMP proponents chose to condense these areas into only seven (7) MZs. The AWQ for each MZ was determined using groundwater data collected primarily from the deeper portions of the aquifer and based on a period of 15 years (from 1999 to 2013). A statistical description of AWQ was completed for each of the seven proposed MZs and a volume-weighted AWQ was computed for the West Whitewater, East Whitewater, and Mission Creek MZs. A single volume-weighted AWQ value was applied throughout the entire vertical and horizontal expanse of the three MZs, even though chemically dissimilar waters or distinct aquifer zones were encountered.

The following table, taken from the CV SNMP, summarizes the AWQ findings:

Table ES-1
Ambient Water Quality Summary

Management Zone	Method	TDS (mg/L)	Nitrate (mg/L as NO3)
West Whitewater River [1]	Volume-weighted	326	9.4
East Whitewater River	Volume-weighted	515	7.0
Mission Creek	Volume-weighted	540	3.0
Garnet Hill [2]	Statistical	Not Determined	
Miracle Hill [2]	Statistical		
Sky Valley [2]	Statistical		
Fargo Canyon [2]	Statistical		

1. Layer 1 of West Whitewater River has too few data points for the volume-weighted method, therefore a median is used.
2. Insufficient data for calculation. Garnet Hill, Miracle Hill, and Sky Valley have less than 10 data points; Fargo Canyon has 13.

Salt and nutrient source identification—The proposed CV SNMP identified potential sources of salt entering the CV as natural recharge from precipitation and surface waters, subsurface inflow from adjacent groundwater basins, artificial recharge of imported water, deep percolation of applied water (irrigation return flows), wastewater percolation, and septic infiltration.

Basin/sub-basin Assimilative Capacity and Loading Estimates—The CV SNMP assigns as the WQO for Total Dissolved Solids (TDS) the "upper" limit of the consumer acceptance contaminant level[1] of 1,000 milligrams per liter (mg/L), and uses an AWQ based on groundwater data collected primarily from the deeper portions of the aquifer over a 15-year period.

The following table, taken from the CV SNMP, summarizes the assimilative capacity findings:

[1] TDS is among a number of chemical constituents regulated pursuant to Secondary Maximum Contaminant Levels (MCLs) prescribed in the California Code of Regulations, title 22, section 64449. Unlike Primary MCLs, Secondary MCLs are not health-related standards. Instead, they address the aesthetic qualities of water, such as odor, visual appearance, and taste. Accordingly, "Consumer Acceptance Contaminant Levels" are prescribed. For TDS, however, no fixed Consumer Acceptance Contaminant Level has been established. Instead, ranges of the levels are specified. For the "recommended" contaminant level of 500 mg/L, the regulation states that constituent concentrations lower than the recommended contaminant level are desirable for a higher degree of consumer acceptance. For the "upper limit" contaminant level of 1,000 mg/L, the regulation states that constituent concentrations ranging to the upper contaminant level are acceptable if it is neither reasonable nor feasible to provide more suitable waters.

Table ES-2
Water Quality Criterion and Assimilative Capacity Summary

Management Zone	TDS (mg/L)	Nitrate (mg/L as NO3)
Water Quality Criterion [1]	1,000	45.0
West Whitewater River	674	30.7
East Whitewater River	485	38.0
Mission Creek	460	42.0
Garnet Hill [2]	Not Determined	
Miracle Hill [2]		
Sky Valley [2]		
Fargo Canyon [2]		

1. TDS water quality criteria is based on the Title 22 CCR "Consumer Acceptance" for municipal beneficial use of 1,000 mg/L.
2. Garnet Hill, Miracle Hill, and Sky Valley have less than 10 data points; Fargo Canyon has 13.

Future water quality for Coachella Valley Groundwater Basin was estimated using a salt and nutrient loading model projected over a 30-year time line (2015 to 2045). The model utilizes assumptions including estimated AWQ, salt and nutrient loading parameters, population growth, land use changes, imported water reliability, local hydrology and indoor waste increments. The model also assumed complete and instantaneous groundwater mixing throughout the MZ. The CV SNMP states there is a high level of uncertainty associated with the loading estimates and suggests that updating the model with newly collected data to improve and calibrate the model is imperative. (pg. 6-24.)

Anti-degradation Analysis—The CV SNMP includes a section for anti-degradation of the West and East Whitewater areas. It does not include an anti-degradation analysis for the Mission Creek MZ. According to the SNMP, TDS concentrations would increase by 7 mg/L and nitrates would increase by 0.5 mg/L by 2045 in the West Whitewater area due to recycled water projects. Recycled water was not included in the East Whitewater area water budget (Table 6-5), but an anti-degradation analysis was done indicating the influence from recycled water projects will increase the AWQ by 9 mg/L TDS and 0.3 mg/L nitrates cumulatively from 2015 to 2045. The CV SNMP concluded that "[b]ased on the currently planned recycled water projects, a significant change in water quality that is inconsistent with the Basin Plan WQOs is not anticipated in the next 30-year water management planning period." (pg. 6-29.)

Basin/sub-basin Wide Monitoring Plan and Implementation Measures—The proposed CV SNMP discussed the Monitoring Plan and describes existing monitoring efforts, actions that may be implemented to enhance monitoring and eliminate data gaps, and stated that recommendations would be provided to enhance the current monitoring program to meet and exceed the policy requirements. Groundwater quality monitoring is currently performed by a number of agencies in the Coachella Valley. Water purveyors are required to monitor water quality for physical constituents, general minerals, metals, radiological constituents and regulated organic compounds at least once every three years and annually for nitrate. Small water systems sample less frequently. Reportedly, 1,909 wells were sampled as part of the CV SNMP. (Technical Memo No. 1 (TM1), p. 47). The CV SNMP includes tables showing 264 wells with construction information and 139 wells with no construction information that are currently utilized for groundwater sampling within CV. Water quality results are reported to the State Water Board Division of Drinking Water and are publicly available on the State Water Board's Groundwater Ambient Monitoring and Assessment Program (GAMA) website. Native American tribes monitor

the quality of their reservation wells and maintain records; however, these data are not publicly available for all tribes. Private wells are not typically monitored on a routine basis; however, CVWD monitors wells in the Mission Creek MZ, Garnet Hill MZ, West and East Whitewater River MZs; and samples wells in the Garnet Hill MZ and the MZs in the Desert Hot Springs Sub-basin.

Existing water level monitoring efforts are conducted by CVWD, Mission Springs Water District (MSWD), and others. CVWD monitors water levels for over 300 public and private wells in its service area, three times per year, on a rotating basis. CVWD and MSWD monitor groundwater levels monthly: (a) in ten (10) wells in the Desert Hot Springs Sub-basin, (b) twenty-two (22) wells in the Mission Springs Sub-basin, and (c) six (6) wells in the Garnet Hill Sub-basin. MSWD also samples its wells on a monthly basis for temperature, pH and TDS when taking water level readings. These data are stored in a database and are plotted as hydrographs. Other agencies monitor groundwater levels in their own wells, but these data are not collated in a central location.

The CV SNMP states that the current monitoring programs are sufficient for regulatory compliance and the level of monitoring is sufficient under existing regulatory guidelines to ensure that the public is provided with a safe and reliable drinking water supply, but also states that additional water quality monitoring would be useful for assessing water quality changes over time and AWQ within MZs (pg. 8-12), which is a requirement of the Policy. Data gaps for areas not covered by the groundwater monitoring plan were noted for each MZ (pg. 8-5). The CV SNMP then recommends no changes to the frequency of monitoring or other actions to enhance the existing groundwater monitoring program (pg. 8-12). Regarding the Policy requirement to analyze for CECs, the CV SNMP states that recycled water is used only for irrigation, with a low risk for ingestion of the recycled water, and therefore did not propose to analyze for any CECs (pg. 8-2).

The CV SNMP summarizes water supply planning goals and provides salt and nutrient management strategies the agencies should consider to help minimize impacts of recycled water projects and protect beneficial uses. A list of planned projects was provided; however, many projects have no obvious connection to salt and nutrient management, such as building a bridge. Other planned projects with potential salt and nutrient management requirements, such as new golf courses, included little to no information regarding the potential effects a particular project may have on salt and nutrient loading in the CV SNMP planning area. The CV SNMP claimed that the findings support the conclusion that the basin water quality will remain within the WQOs for the constituents of concern and therefore, implementation measures are not needed (pg. 7-1).

Summary of RB Staff Response to the Proposed Coachella Valley SNMP

Throughout development of the proposed CV SNMP, Regional Water Board staff attended and provided comments at multiple stakeholder meetings sponsored by the proponents of the SNMP. The CV SNMP is based on two Technical Memoranda. When Technical Memorandum (TM) 1 was available for review and comment, Regional Water Board staff provided comments that focused on technical concerns of the proposed approach to develop the SNMP, including concerns on how AWQ and assimilative capacity were going to be determined, and compliance with the anti-degradation policy. The proponents of the SNMP revised TM1 on October 16, 2014. However, after reviewing the revised TM1, it is the Regional Water Board staff's conclusion that the revised TM1 still failed to adequately address the concerns previously raised by staff.
Similarly, when the proponents of the SNMP generated TM2, Regional Water Board staff provided written comments on November 5, 2014, which again focused on significant technical concerns

of the proposed approach, including, again, the AWQ and assimilative capacity determinations. Other stakeholders also expressed written concerns about the Technical Memoranda. During the February 19, 2015, Regional Water Board Public Workshop on the CV SNMP, Regional Water Board staff again reiterated its concerns. The proponents of the CV SNMP finalized their SNMP in June 2015. Therefore, because the concerns raised by Regional Water Board staff were not addressed, staff concludes that the proposed CV SNMP does not fully comply with the Recycled Water Policy and Resolution 68-16. The following sections discuss the key deficiencies.

General Comments

The proposed CV SNMP is incomplete because it does not establish AWQ for four MZs (MZ4: Garnet Hill, MZ5: Miracle Hill, MZ6: Sky Valley, and MZ7: Fargo Canyon). It is also incomplete because it does not establish Assimilative Capacity for these MZs. Further, it is incomplete because it does not include a monitoring program to establish AWQ and Assimilative Capacity for these MZs. Measures to protect the beneficial uses of the aquifer could not be assessed for these MZs either.

Ambient water quality

Accurate AWQ is foundational to other key elements of a SNMP. In other words, failure to properly establish AWQ leads to the incorrect determination of the other required elements of the SNMPs, including determination of assimilative capacity, determination of compliance with Resolution 68-16, and establishment of appropriate site-specific objectives to protect the beneficial uses of the aquifer. The proposed SNMP determined the AWQ for three MZs using a baseline period of 15 years (from 1999 to 2013) and utilized groundwater quality data collected primarily from the deeper portions of the aquifer. I could find no documentation in our records that the previous Regional Water Board EO or the current Interim EO has approved the use of an alternative data set. Using a 15-year period to determine current water quality is questionable from a technical perspective because using older data blurs the impacts from more recent salt and nutrient loadings. It is also questionable because the proponents of the SNMP used a compete-mixing model to calculate AWQ, which masks the current water quality degradation of the upper portions of the aquifer at the expense of the excellent to very good water quality of the lower portions of the aquifer. The following paragraph elaborates on these technical concerns.

Historical groundwater data are useful to assess trends in water quality and the impacts to water quality from imported water and waste discharges. An analysis of TDS and nitrate concentration trends completed for the CV SNMP show increasing TDS and nitrate concentrations with time, indicating the older groundwater data represent a better water quality. The use of water quality data that are not current or representative of the MZ for the determination of AWQ should not be acceptable. The volume-weighted method to determine AWQ is a mixing model that applies a single AWQ value throughout the entire vertical and horizontal expanse of each MZ, even though chemically dissimilar waters, and in some cases, distinct aquifer zones were encountered. The AWQ was determined using groundwater quality data collected primarily from the deeper portions of the aquifer. These groundwater data are not representative of water quality in the upper part of the aquifer where impacts from surface discharges first occur. If higher TDS and nitrate concentrations reportedly present in the shallow groundwater are not considered in averaging the water quality for the area, the AWQ will be skewed giving the appearance of higher water quality, and will not be representative of the aquifer. This does not provide a realistic representation of AWQ. Also, the proposed CV SNMP does not establish AWQ for four MZs.

Salt and nutrient source identification

Accurate assessment of salt and nutrient sources is paramount to the development of a SNMP that is protective of water quality. Even though the proposed CV SNMP identifies potential sources of salt entering the aquifer, it contains many inconsistencies and lacks data to substantiate the values stated.

Artificial recharge using Colorado River water (referred to as State Water Project [SWP] exchange water) has been conducted in the West and East Whitewater areas since 1973 and in the Mission Springs Sub-basin since 2002. This water has a relatively high TDS (~ 870 mg/L). The CV SNMP discussed the strategies for management of salts in the basin and states that about 350,000 tons of salt are added to the basin each year through artificial recharge using Colorado River water. On the other hand, Tables 6-9, 6-11, and 6-13 of the proposed SNMP indicate an annual total of 122,500 tons of salt entering the Coachella Valley via Colorado River water for the years between 2015 and 2020. The discrepancy of salt input to the basin via artificial recharge of Colorado River water is not explained within the text of the CV SNMP. (Pages 7-4, 6-18, 6-20, 6-22.)

Irrigation return flows from the local golf courses and agriculture are the other two significant salt and nutrient loaders in the aquifer. The CV SNMP reports golf courses' demand for groundwater in the West and East Whitewater and the Mission Creek areas is 51,900 acre-feet per year for the years between 2015 and 2020, and indicates the water budget is based on projections and plans presented in the 2010 Coachella Valley Water Management Plan Update. However, the 2010 Coachella Valley Water Management Plan Update reports the golf courses' demand for water is 118,800 acre-feet per year for the year 2015 with a small portion of that volume from recycled water. This amount of water correlates well with the amount of water that an article in the Los Angeles Times reported that golf courses in the Coachella Valley use 37 billion gallons of water annually. Based on the foregoing, the proposed SNMP underestimates the amount of water used for golf course irrigation. Underestimating the volume of groundwater and recycled water used for golf course irrigation will, in turn, underestimate the salt and nutrient loading estimates from the return flow of the irrigation water.

The CV SNMP states that there are localized areas with high nitrate concentrations and attributes at least one of these areas with high nitrates to natural conditions from "…an ancient Mesquite forest...." (P. 4-16.) This is at best speculative because groundwater wells located in this area continue to report increasing nitrate concentrations, indicating the source of nitrate loading may still be present. This potentially natural source of nitrates was not included in any of the salt and nutrient loading budgets.

Basin/sub-basin Assimilative Capacity and Loading Estimates

Assimilative capacity (the difference between the applicable WQO and the AWQ) is a measurement of the amount of salt and nutrients a water body can receive without exceeding the WQO. Determining the available assimilative capacity of a MZ is a requirement of SNMPs. As stated above, the proposed CV SNMP assigns a WQO of 1,000 mg/L TDS for the entire aquifer.

The Regional Water Boards establish WQOs in their Water Quality Control Plans (Basin Plans) as limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area. The Basin Plan specifies a numeric and narrative WQO for nutrients and salts, respectively, and Title 22 of the California Code of Regulations (CCR) establishes primary and secondary maximum contaminant levels (MCLs). The Basin Plan specifies a narrative standard for Taste

and Odor that applies to groundwaters designated Municipal. Groundwater in the Coachella Valley is used for Municipal and domestic supply. As stated in the Basin Plan, the WQO for TDS in groundwater is to "...maintain the existing water quality of all non-degraded groundwater basins. ... minimize the quantities of contaminants reaching any groundwater basin. And ... maintain the existing water quality where feasible." The provisions of Title 22 state that the consumer acceptance contaminant level ranges for the Secondary MCL of TDS are: Recommended Limit = 500 mg/L, Upper Limit = 1,000 mg/L, and Short Term Limit = 1,500 mg/L.

The proposed WQO of 1,000 mg/L TDS is not appropriate for several reasons. First, using 1,000 mg/L as the WQO for TDS is inconsistent with the Anti-degradation Policy. Even if the AWQ had been properly established, TDS for some areas of the Coachella Valley are in the 300-400 mg/L TDS range or better. Since the quality of these waters is better than California's "recommended" limit of 500 mg/L, they are considered high quality waters under Resolution 68-16. However, the proposed SNMP fails to include a comprehensive Anti-degradation Analysis to justify the proposed doubling, tripling, and in some cases quadrupling of the salts in the aquifer.

Second, using a 1,000 mg/L WQO for TDS will likely have the negative consequence of encouraging additional and unnecessary salt and nutrient loading in those areas of the basin/sub-basin demonstrated to be high quality waters (such as the Garnet Hill MZ with TDS concentrations ranging from 186 to 376 mg/L, and portions of the other MZs reporting TDS as low as 135 mg/L [Whitewater River], 270 mg/L [Mission Creek], and 240 mg/L [Desert Hot Springs]). To allow such water quality degradation would needlessly reduce the beneficial use for future generations. This proposed change in water quality is not "consistent with the maximum benefit of the people of the State."

The assimilative capacity assigned to each MZ for TDS (the difference between the TDS WQO and AWQ) was based on an "upper" TDS WQO limit of 1,000 mg/L that is not protective of beneficial uses, and uses an AWQ that is underestimated and improperly established. This proposed high limit for the TDS WQO, coupled with the underestimated AWQ, results in assigning more assimilative capacity than actually exists.

Anti-degradation analysis

The anti-degradation analysis is a key component of the Recycled Water Policy, and SNMPs must comply with the Anti-degradation Policy (Resolution 68-16). (P. 8, para. 6.b.(3)(f).) The intent of the SNMPs is to manage all sources of salt and nutrient loading. This requires analysis of the effects on the aquifer from all sources. There were not enough data to conduct an anti-degradation analysis for most of the MZs, and the analysis provided in the CV SNMP did not consider all the sources of salts and nutrients entering the MZs. Thus, the anti-degradation analysis is incomplete and fails to justify the proposed degradation of pristine waters to the proposed TDS WQO of 1,000 mg/L.

A basin/sub-basin wide monitoring plan. Implementation measures to manage salt and nutrient loading in the basin on a sustainable basis.

The Recycled Water Policy requires that each SNMP include a basin/sub-basin wide monitoring plan that includes an appropriate network of monitoring locations. The monitoring plan must be designed to determine water quality in the basin. The CV SNMP groundwater monitoring program does not provide adequate information for any of the MZs and is not sufficient to comply with the Recycled Water Policy. There is little to no information for the Garnet Hill, Miracle Hill, Sky Valley, Fargo Canyon, and the northern portion of Mission Creek MZs, and particularly for the perched

and shallow aquifer zones within the East Whitewater MZ and the upper portion of the aquifer within the West Whitewater MZ, where salt loading is most likely to occur. The CV SNMP notes the known data gaps on Table 8-1 (pg. 8-5), and acknowledges that "[d]ata gaps limit the ability to adequately characterize groundwater quality both spatially and vertically." (pg. 8-4.) The monitoring plan does not provide adequate information to determine AWQ and therefore assimilative capacity, as required by the Policy. There are many data gaps identified in the CV SNMP, which could be eliminated by providing a more robust monitoring plan. The CV SNMP recommended no changes to the frequency of monitoring or other actions to enhance the existing groundwater monitoring program.

The CV SNMP states that recycled water is used only for irrigation with a low risk for ingestion of the recycled water, and therefore did not propose to analyze for any CECs, but later states that recycled water not used for irrigation may be percolated when demand is low. There are many areas in the Coachella Valley that still use septic systems for waste disposal. Septic system wastes contain CECs. Additionally, the CV has seven wastewater treatment plants that discharge to evaporation/percolation basins. These plants also discharge CECs. Yet, the proposed SNMP does not include a monitoring plan to track or assess the threat from these sources of pollution and CECs. Until sufficient monitoring data can be obtained and reported, the current AWQ, and therefore, the assimilative capacity of the MZs located within the CV Groundwater Basin, cannot be determined.

The CV SNMP summarizes water supply planning goals and provides salt and nutrient management strategies the agencies should consider to minimize impacts of recycled water projects and protect beneficial uses. However, the CV SNMP further states that none of the suggested strategies would be implemented. The CV SNMP asserts that "[t]he findings in previous sections support that the basin water quality is remaining within the WQOs for the constituents of concern and therefore corrective measures are not needed."

SUMMARY AND RECOMMENDATIONS

The proposed SNMP is incomplete and does not fully comply with the Recycled Water Policy:

1. The SNMP does not establish AWQ and Assimilative Capacity for the Garnet Hill, Miracle Hill, Sky Valley, and Fargo Canyon Management Zones.

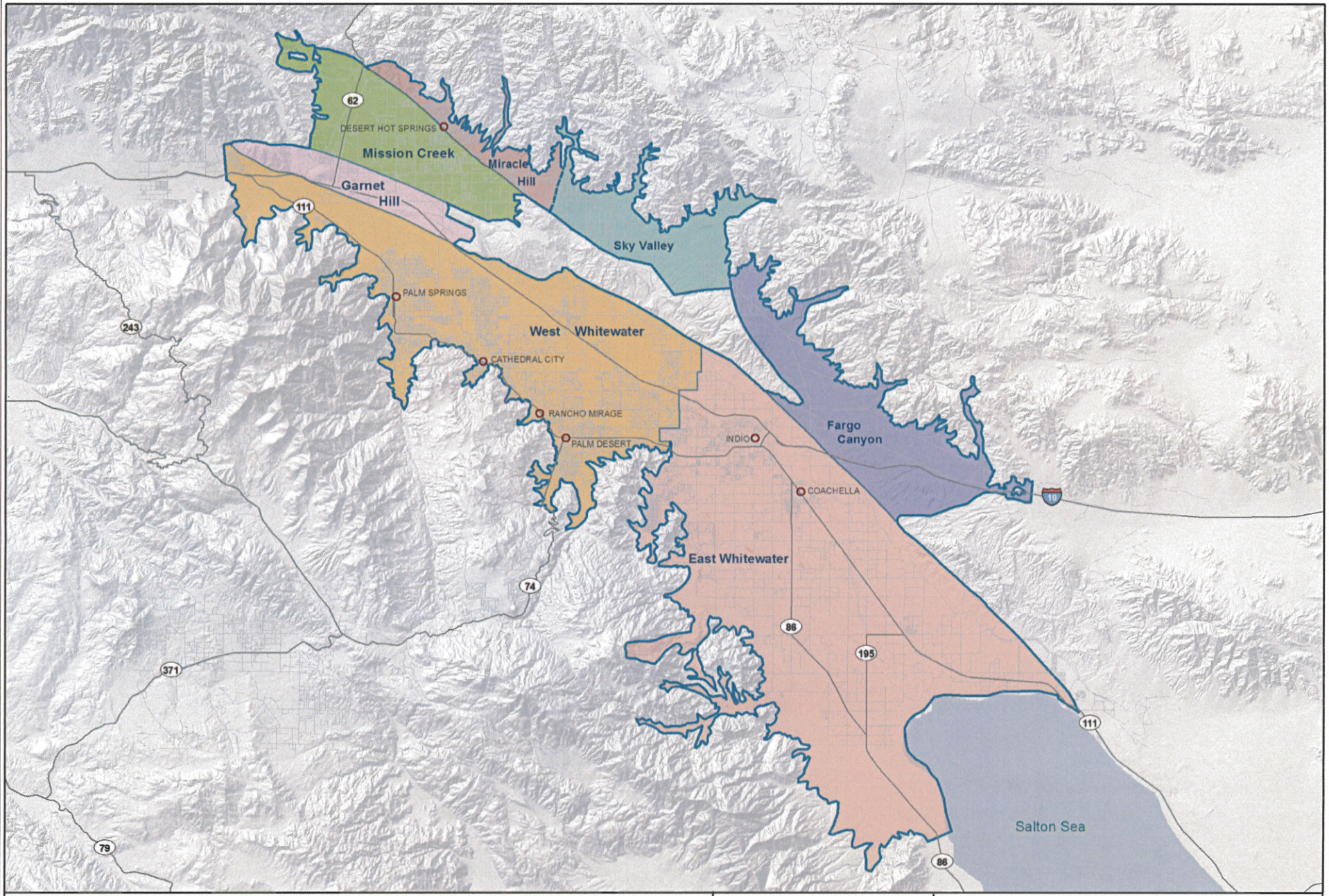
2. The SNMP does establish AWQ for three (3) other Management Zones (West Whitewater River, East Whitewater River, and Mission Creek), but the methodology used for establishing the AWQ for these zones is not representative of actual current ambient water quality, and masks ongoing groundwater degradation.

3. The proposed SNMP uses a TDS WQO of 1,000 mg/L to calculate the Assimilative Capacity of the West Whitewater River, East Whitewater River, and Mission Creek Management Zones. Such a site-specific water quality objective could, in some cases, allow the TDS concentration of groundwater to be quadrupled. The proposed SNMP, however, fails to include an adequate Anti-degradation Analysis to justify such a site-specific objective, as required by the Recycled Water Policy.

4. The proposed SNMP does not adequately characterize the salt contribution from key significant salt sources, such as golf courses.

5. The proposed SNMP does not include a proposed monitoring program to properly characterize AWQ in the Garnet Hill, Miracle Hill, Sky Valley, and Fargo Canyon Management Zones; nor does it include a monitoring and reporting program to track CECs.

We should recommend that the Regional Water Board not approve or accept the proposed CV SNMP until such time as the proponents of the SNMP have adequately addressed all of the foregoing concerns.


DESERT HOT SPRINGS
Mission Creek
Miracle Hill
Garnet Hill
Sky Valley
PALM SPRINGS
West Whitewater
CATHEDRAL CITY
RANCHO MIRAGE
PALM DESERT
INDIO
Fargo Canyon
COACHELLA
East Whitewater
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Coachella Valley
SNMP Management Zones
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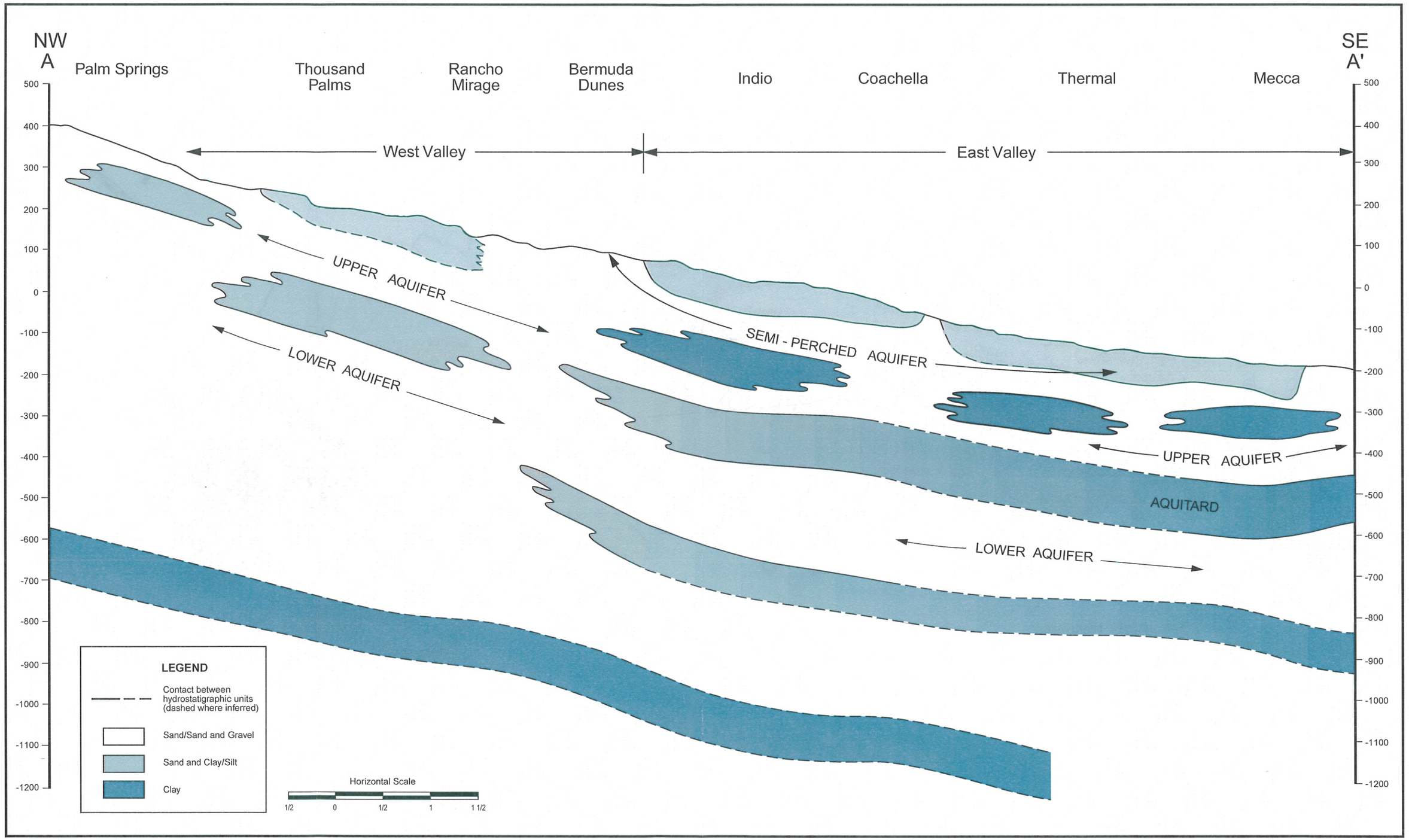
Figure 4-4



Appendix B-2
Conceptual Hydrogeologic Cross Section of the Coachella Valley